CLAIMS

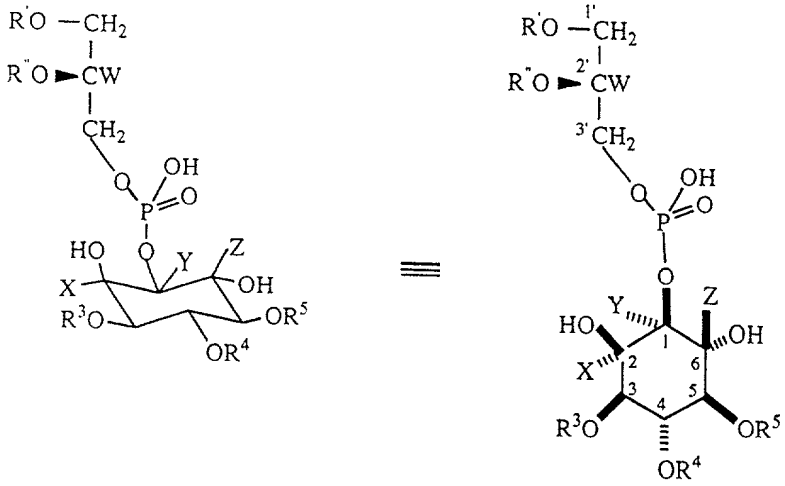
1. A composition comprising a substantially purified phosphoinositide compound that comprises at least a first stable or radioactive isotope.

2. The composition of claim 1, wherein said phosphoinositide compound comprises at least a first (poly)unsaturated fattyacyl residue.

3. The composition of claim 1, wherein said phosphoinositide compound comprises at least a first stable or radioactive isotope within the inositol or glycerol component of said phosphoinositide compound.

4. The composition of claim 1, wherein said phosphoinositide compound comprises at least a first ^{2}H, ^{3}H, ^{13}C, ^{14}C, ^{32}P, ^{33}P or ^{35}S isotope.

5. The composition of claim 4, wherein said phosphoinositide compound has the structure:

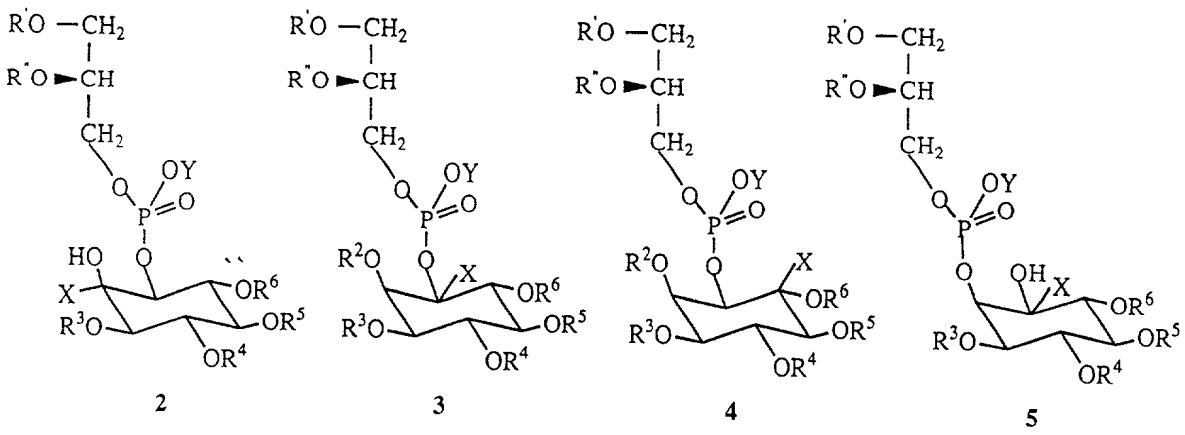


1: W, X, Y, Z = ^{3}H, ^{2}H or ^{1}H, wherein at least one of W, X, Y or Z is ^{3}H, ^{2}H;
R', R" = Fattyacyl, Alkyl or H; R^3, R^4, R^5 = H, $P(O)(OH)_2$

6. The composition of claim 1, wherein said phosphoinositide compound further comprises temporary protecting groups at hydroxyl and phosphate positions other than the position of said at least a first stable or radioactive isotope.

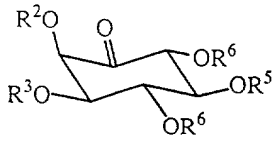
7. A composition comprising a synthetic intermediate of an isotopically labelled phosphoinositide compound, said synthetic intermediate comprising temporary protecting groups at hydroxyl and phosphate positions other than the position into which the isotopic label is to be introduced.

8. The composition of claim 7, wherein said synthetic intermediate has the structure:



2 3 4 5

or



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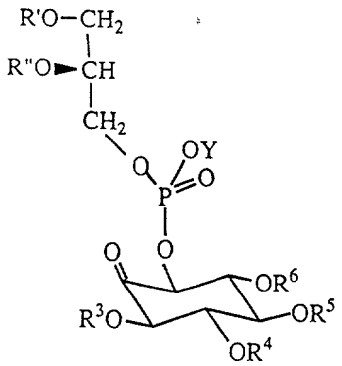
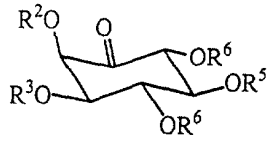
$X = {}^2H$ or ${}^3H$; Y = Alkyl, CH_3 or OH;
R', R" = Fattyacyl, Alkyl or H; R^2 = H or OH protecting group;
R^3, R^4, R^5 = (OH protecting group) or (P(O)(O protecting group)$_2$) or (P(O)(OH)(O protecting group)) or (P(O)(OH)$_2$)
R^2, R^6 = H or (OH protecting group)

9. The composition of claim 8, wherein said synthetic intermediate has the structure:



10. The composition of claim 8, wherein said synthetic intermediate has the structure:



11. A method for preparing a synthetic intermediate of an isotopically labelled phosphoinositide compound, comprising introducing at least a first stable or radioactive isotope into said synthetic intermediate at a stage late in the synthesis.

12. The method of claim 11, comprising:

(a) preparing a substantially protected phosphoinositide compound that comprises an unprotected sec-OH group; and

(b) introducing a ^{2}H or ^{3}H isotope into said unprotected sec-OH group.

13. The method of claim 12, comprising:

(a) preparing a uniquely deprotected phosphoinositide compound wherein one sec-OH group is unprotected and the remaining OH groups are attached to temporary protecting groups;

(b) oxidizing said uniquely deprotected phosphoinositide compound to prepare a phosphatidyl-inososе compound comprising a ketone group at the position of the unprotected sec-OH group; and

(c) introducing a ^{2}H or ^{3}H isotope into said phosphoinositide compound by reducing said ketone group of said phosphatidyl-inososе compound.

14. The method of claim 13, further comprising removing said temporary protecting groups from said remaining OH groups to convert said synthetic intermediate into an isotopically labelled phosphoinositide compound.

15. The method of claim 11, comprising:

(a) preparing a labelled inositol derivative that comprises a ^{2}H or ^{3}H isotope; and

(b) conjugating said labelled inositol derivative to a phosphatidyl residue.

16. The method of claim 15, comprising:

(a) preparing a selectively protected myo-inositol compound wherein the equatorial 1-OH group is unprotected and the remaining OH groups are attached to temporary protecting groups;

(b) oxidizing said selectively protected myo-inositol compound to prepare the corresponding inosose compound that comprises a ketone group at the position of the unprotected equatorial 1-OH group;

(c) introducing a ^{2}H or ^{3}H isotope into said myo-inositol compound by reducing said ketone group of said inosose compound to provide a labelled inositol derivative; and

(d) coupling said labelled inositol derivative to a phosphatidyl residue.

17. The method of claim 16, further comprising removing said temporary protecting groups from said remaining OH groups to convert said synthetic intermediate into an isotopically labelled phosphoinositide compound.

18. A method for preparing an isotopically labelled phosphoinositide compound, comprising preparing a synthetic intermediate that comprises at least a first stable or radioactive isotope and temporary protecting groups at positions other than the position of said at least a first stable or radioactive isotope, and removing said temporary protecting groups to yield said isotopically labelled phosphoinositide compound.

19. The method of claim 18, comprising:

(a) preparing a substantially protected phosphoinositide compound that comprises a plurality of protected OH groups attached to temporary protecting groups and an unprotected sec-OH group;

(b) introducing a ^{2}H or ^{3}H isotope into said unprotected sec-OH group; and

(c) removing said temporary protecting groups from said plurality of protected OH groups.

20. The method of claim 18, comprising:

(a) preparing a selectively protected myo-inositol compound that comprises a plurality of protected OH groups attached to temporary protecting groups and an unprotected equatorial 1-OH group;

(b) introducing a ^{2}H or ^{3}H isotope into said unprotected equatorial 1-OH group to provide a labelled inositol derivative;

(c) conjugating said labelled inositol derivative to a phosphatidyl residue; and

(d) removing said temporary protecting groups from said plurality of protected OH groups.